BTEC Assignment Brief

Qualification	Pearson BTEC Level 3 National Extended Diploma in Manufacturing Engineering (1080 GLH) 601/7589/8 Pearson BTEC Level 3 National Extended Diploma in Aeronautical Engineering (1080 GLH) 601/7585/0 Pearson BTEC Level 3 National Extended Diploma in Engineering (1080 GLH) 601/7588/6 Pearson BTEC Level 3 National Diploma in Engineering (720 GLH) 601/7580/1 Pearson BTEC Level 3 National Diploma in Manufacturing Engineering (720 GLH) 601/7582/5 Pearson BTEC Level 3 National Diploma in Aeronautical Engineering (720 GLH) 601/7577/1
Unit number and title	Unit 47 – Composites Manufacture and Repair Processes
Learning aim(s)	**B:** Investigate the processes used to manufacture and repair fibre-reinforced polymer composites.
Assignment title	Fibre-Reinforced Polymer Composites manufacture and repair.
Assessor	
Hand out date	
Hand in deadline	

Vocational Scenario or Context	***[Delete all italic red text before issue to the learners]*** The benefits of using composite materials over traditional materials has become increasingly apparent in many engineering applications. This has led to them being used more frequently in different engineering sectors including automotive to aerospace and power generation. You are working as a trainee engineer in [insert company name] and following on from the work you conducted for Learning Aim A, the customer needs to understand the difference between FRP wet layup and dry layup manufacturing processes. The company has been approached by a client to manufacture [*insert component names and where possible different learners should have different components to investigate*]. The client has specified that the component must be manufactured out of **fibre-reinforced polymer (FRP**) **composite material** and has requested information on whether to use a wet lay or dry lay manufacturing process. They have also requested information about how surface damage and through-hole damage to the component should be repaired.
Task 1	You are to produce an accurate technical report to evaluate the characteristics of the FRP wet layup and dry layup manufacturing processes. For the wet layup and dry layup processes your report must include the following for each application and make comparisons between the processes: • The method of manufacture including any specialist

	tools and equipment required • Safe working practices • Typical design parameters e.g. material thickness • Consideration of both glass fibre and carbon fibre materials • The fibre volume fraction • In-process errors such as voids and inclusions • Skill levels required and speed of production • Storage of materials • Curing of materials Your report must also evaluate the characteristics of both surface and through-hole repair processes on both wet layup and dry layup manufactured components. You will need to include the following for each application and make comparisons between the processes: • Safe working practices • Damage assessment methods • Removal of damage • Repair area preparation • Selection of an appropriate repair method • The repair method/completion process • Post repair assessment and inspection • Restoration of surface finish
Checklist of evidence required	Written report Illustrations and references as appropriate

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
B.D2	Evaluate the characteristics of FRP composite manufacturing and repair processes, including the safe working practices that apply.
B.M3	Compare the processes used to repair both surface and through-hole damage in FRP composite components, including the safe working practices that apply.
B.M2	Compare the characteristics of the wet and dry lay-up composite manufacturing processes, including the safe working practices that apply.
B.P3	Explain the processes used to repair both surface and through-hole damage in FRP composite components, including what safe working practices apply.
B.P2	Explain the characteristics of the wet and dry lay-up composite manufacturing processes, including what safe working practices apply.

Sources of information to support you with this Assignment	Composite repair manuals Class notes Manufacturers process documentation